

BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, D.C. 20268-0001

PERIODIC REPORTING
(PROPOSAL THREE)

Docket No. RM2016-11

PETITION OF THE UNITED STATES POSTAL SERVICE FOR THE
INITIATION OF A PROCEEDING TO CONSIDER PROPOSED CHANGES
IN ANALYTICAL PRINCIPLES (PROPOSAL THREE)
(August 22, 2016)

Pursuant to 39 C.F.R. § 3050.11, the Postal Service requests that the Commission initiate a rulemaking proceeding to consider a proposal to change analytical principles relating to the Postal Service's periodic reports. The proposal, relating to the design and operation of the In-Office Cost System (IOCS), is labeled Proposal Three and is discussed in detail in the attached text.

Respectfully submitted,

UNITED STATES POSTAL SERVICE

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Proposal Three

Proposed Change to In-Office Cost System Sampling of City Carriers

Objective

The Postal Service proposes a change in the In-Office Cost System (IOCS) methodology for sampling city carriers for in-office costs. Census data from TACS and DOIS that are now available enable a new cluster sampling approach that allows data collectors to take on-site readings in the morning, which is when carriers incur most of their in-office workhours. The new design improves data quality by obtaining far more data from on-site rather than telephone readings, while simultaneously improving data collection efficiency.

Parallel testing of the new system is being undertaken now, having been implemented nationwide beginning January 17, 2016. In order to limit the additional costs caused by such parallel testing, the Postal Service requests that the Commission act on this proposal to use the new cluster approach as quickly as possible.

Background

The current IOCS sampling design uses a multi-stage probability sample to randomly select craft employees, including city carriers, then an interval of work time from the employee's tour, ultimately resulting in an observation that represents a "snapshot" of the work activities in a sampled interval. A result of that design is that readings are widely dispersed, both in time and in space. Furthermore, the current IOCS was designed to estimate carrier time while on the street as well as in-office, so

there are many readings performed over the entire working day. It is costly to have data collectors travel to do just one IOCS reading out at a distant delivery unit, so most carrier readings are conducted by telephone. In FY2015, there were over 200,000 individual readings scheduled on city carriers, and over 80 percent of those were telephone readings.

The availability of census data from the Time and Attendance Collection System (TACS) affords the opportunity to significantly reshape the sampling design. Proposal Nine (RM2015-2), for example, would replace IOCS estimates of carrier street time with TACS data, so that sample data need not be collected on carriers' street time.¹ Proposal Nine also would use TACS in-office workhours to control the estimates of in-office costs by route group (letter versus special purpose routes) and by craft subgroup (fulltime versus part-time/transitional carriers). Furthermore, we can aggregate TACS clock ring data to even finer levels of detail, such as by time bins, and then scale sampling data up to census totals. Therefore, we no longer need to distribute IOCS readings equally over time. Rather, we can cluster readings to the times when carriers are most frequently working in the office and can use TACS workhours to weight the readings appropriately, accounting both for the time and location where readings are taken. With the use of census data, it becomes possible to justify sending data collectors out to delivery units to perform clusters of on-site carrier readings.

¹ For street time readings, IOCS does not observe the specific activity at the time of the reading, but only records that the carrier is on the street, together with data on the carrier's route.

Proposal Three

The Postal Service has developed a data collection system to implement this cluster sampling approach. Parallel testing of this new system, along with the existing non-cluster IOCS, began nationally on January 17, 2016.

Proposal

The Postal Service proposes to change the system design for city carriers to two-stage cluster sampling approaches that use census data from TACS to control the estimation.

Following are the key elements of the proposal:

- In the morning when carriers are working in-office, use clustered on-site readings in sampled delivery zones.
 - For zones with 6 or more routes, use stand-alone IOCS-Cluster tests (Sampling Mode 1 described below).
 - For zones with 5 or fewer routes, use IOCS-Cluster tests that are synchronized with City Carrier Cost System (CCCS) tests (Sampling Mode 2).
- In the afternoon, the Postal Service offers two alternatives.
 - The recommended alternative is to treat all afternoon carrier in-office time from TACS as Support time, and therefore conduct no readings in the afternoon.
 - In the less preferred alternative, afternoon readings are clustered together into one-hour intervals and are all conducted by telephone (Sampling Mode 3)

Proposal Three

- For carriers clocked to Special Purpose Routes (SPR), the Postal Service similarly offers two alternatives.
 - The recommended alternative is to treat all in-office SPR time from TACS as support time for the street, and use the distribution keys from the City Carrier Cost System (CCCS).
 - In the less preferred alternative, use sample readings to construct the distribution key for SPR In-Office time. Because of the paucity of in-office readings for SPR carriers, sample carriers who clock to SPR more heavily than carriers who only clock to letter routes.
- Use TACS data to develop control totals for costs, and use fine-grained TACS and DOIS data, by finance number, zone, time bin, route group and carrier subgroup, to weight IOCS-Cluster readings in the estimation process.
- Carriers acting as supervisors receive supervisor-type readings, similar to current non-cluster IOCS. Use TACS data to provide control totals for the portion of supervisor costs incurred by employees whose base craft is carrier, but have clocked as supervisor.

A full description is provided in Appendix A, “In-Office Cost System: Cluster (IOCS-Cluster) Statistical Documentation.” Additional supporting materials are provided in public folder USPS-RM2016-11/1 and nonpublic folder USPS-RM2016-11/NP1. A brief description is provided here.

Morning Hours

Sampling Mode 1: Morning tests clustered by zone / On-site / Stand-alone

Mode 1 is the primary sampling mode of the proposed IOCS-Cluster subsystem, used for on-site sampling of zones with six or more routes. Zones are selected randomly in proportion to their size, measured as their number of in-office hours. Data collectors conduct on-site readings on the cluster of carriers assigned to the selected delivery zone on the selected day. They identify all carriers working in that zone, and the list of carriers is randomized. They conduct readings on carriers in the randomized sequence continuously all morning, as long as any carriers are working in the office².

The data collection software helps the data collector find the next carrier to sample by providing historical information about the most common route numbers that the carrier has worked. If they complete readings on all carriers in the list, they then repeat the sequence so there may be multiple readings on the same carrier over the course of the morning. The software remembers the most recent route recorded for each carrier, again assisting the data collector to find the carrier quickly and efficiently. Because of the sampling design and software features, data collectors are typically able to obtain 20 to 40 active non-stop on-site readings during morning tests³. We propose to schedule 4,000 of these primary mode tests annually, and expect to obtain more than 100,000 active readings.

² Or until 11:00, whichever comes first.

³ Based on the 1st to 3rd quartile of the number of active (non-stop) readings.

In FY2016 Q2 and Q3, 1,830 mode 1 tests were conducted, and 56,168 active readings were obtained, about 30 readings per test.

Sampling Mode 2: Morning tests clustered by zone / On-site / Synchronized with CCCS

The primary sampling mode of on-site stand-alone tests, Mode 1, is suitable when there are a sufficiently large number of city carriers working the selected zone. However, for zones with few city carriers, it is problematic to sample carriers continuously because the data collector could conduct multiple readings on the same employee that are just a few minutes apart. Data collection policy is that readings are not conducted on the same individual within a twenty minute period. This would reduce the expected number of readings to a low level that would not justify sending a data collector on-site. However, the Postal Service proposes a second sampling mode for small zones, synchronizing IOCS-Cluster tests with City Carrier Cost System (CCCS) tests when a data collector is already scheduled to be on-site at a delivery unit. Whenever CCCS is testing a route that belongs to a zone with five or fewer routes, an IOCS-Cluster Mode 2 test is scheduled for the same location and day. Out of every half-hour period, the data collector performs CCCS tasks for 20 minutes and conducts IOCS-Cluster readings for 10 minutes. Similar to the sampling mode 1, the data collector samples continuously during the 10-minute period. They would not sample the same employee within the same 10-minute time block. Typically, mode 2 tests obtain about 5 to 10 active readings over the course of a morning. The Postal Service

proposes to schedule 1,000 of these secondary mode tests annually and expects to obtain 6,000 or more active readings.

In FY2016 Q2 and Q3 there were 455 mode 2 tests conducted, and from these were obtained 3,804 active readings, about 8 readings per test.

Sampling Efficiency

IOCS-Cluster data collection procedures take advantage of one of the elements of Proposal Nine (RM2015-2) in which data on carriers' street time is obtained from TACS census system rather than estimated by IOCS. When a carrier is doing activities typically performed while clocked to the street, this is recorded in the IOCS-Cluster data collection software with one click. This includes carriers who are actually on the street, in the parking lot or on the loading dock preparing to leave for their route. The ability to avoid the time-consuming readings on carriers who are outside the facility enables data collectors to perform more readings on carriers who are performing in-office activities. The software features described above, which provide information to the data collector, also improve sampling efficiency.

Afternoon Hours

The first two sampling modes cover carriers' time in the morning, when they typically are in the office and handling mail. Carriers spend relatively little time in the office after the initial morning casing work⁴. The large majority of in-office time in the

⁴ IOCS-Cluster defines the morning period up to 11 am and the afternoon period after 11:00.

Proposal Three

afternoon is devoted to various non-handling activities such as returning from their route, clocking in/out, personal needs and routine office work. After clocking back to the office, carriers do not handle mail very often. In FY2015, direct tallies recording mailpiece handling represented less than ten percent of afternoon in-office time, and less than one percent of carrier in-office cost overall. Current operations procedures generally do not afford carriers the opportunity to case mail in the afternoon. This is partly because routes have been re-structured so most routes take up an entire carrier's day and there is no longer a need to fill the carrier's workhours with in-office work to meet carriers' minimum hour requirements.

Because there are too few carriers in the office for too short a period of time in the afternoon, it is not practicable to send a data collector to perform IOCS readings on-site. It is particularly problematic if the intent remains to randomize the carriers, as it is unlikely that the next carrier in the randomized sequence will happen to be in the office. Instead, they will most likely still be on the street or will already have clocked out. Further, there are very few occasions where data collectors would already be on-site at delivery units in the afternoon for other Statistical Program systems. Thus, there are very few opportunities for synergies with other systems as there are with CCCS.

Because the majority of the carriers afternoon in-office time are for support activities rather than mailpiece handling, and because of the difficulty in sampling carriers efficiently, the Postal Service recommends treating all afternoon time as a support activity. TACS data can assign the afternoon in-office hours to the appropriate route group and carrier group.

However, should the Commission wish to continue to sample the afternoon, we propose a third sampling mode.

Sampling Mode 3: Afternoon tests clustered by hour / Telephone

This sampling mode is a proposal to obtain data when there are too few carriers in one facility at any one time. After the morning hours, IOCS-Cluster telephone tests are scheduled for one-hour blocks of time. The data collection software generates a randomized sequence of carriers from IOCS panel offices across the district. The data collector calls for each carrier in the sequence, making as many calls as possible over the one-hour time block. If they cannot reach a respondent within three minutes, the data collector would record a stop reading and would go on to the next carrier in the randomized sequence.

Even with these aggressive data collection procedures only about 2 percent of attempts during these time blocks result in active readings. This is similar to current non-cluster IOCS telephone readings on carriers in the afternoon. These hour-long tests average approximately 25 attempts each, but most obtain no active readings where the carrier is in the office. Only ten percent of those few active readings record the carrier handling a mailpiece, also consistent with current IOCS.

During FY2016 Q2 and Q3, the Postal Service conducted 556 mode 3 hour-long cluster telephone tests. There were 15,730 telephone attempts, but from these were obtained only 389 active readings and only 22 readings where a carrier was handling a mailpiece.

Special Purpose Routes

Carriers that clock to Special Purpose Routes (SPR) generally spend relatively little time in the office, about ten percent. Because time spent clocked to SPR is a relatively small fraction of overall city carrier time, the SPR contribution to total carrier in-office time is very small, less than 3 percent. As a result, it is relatively difficult for data collectors to find SPR carriers to sample.

Furthermore, unlike carriers clocked to letter routes that spend over 85 percent of their office time handling mail, SPR carriers handle mail less than 35 percent of their in-office time. Thus, even after finding an SPR carrier, the data collector usually cannot even record a mailpiece to be used for a distribution key.

Because of the small impact of SPR in-office time and the difficulty in obtaining a sufficiently large sample of readings with mailpieces, the Postal Service proposes to treat SPR in-office time as a support activity for its street time. This would result in the distribution of in-office costs using the same distribution key as for street time. A new activity code would be introduced to represent these in-office hours that are volume-variable to the same degree as all in-office direct labor, and distributed on the street distribution key.

However, should the Commission wish to continue to sample SPR in-office, the Postal Service has included sampling of these carriers in the current IOCS-Cluster design. Data collectors sample all SPR carriers in the facility where they are conducting an IOCS-Cluster test. This includes SPR carriers working outside of the tested zone, which can occur when the facility is responsible for multiple zones. Nevertheless, even

with this heavy sampling, this design obtained a relatively limited number of tallies when the SPR carrier was handling mail.⁵

In addition, the current design of IOCS-Cluster does not include testing on Sundays since carriers do not work regular letter routes on Sundays. However, about 95 percent of Sunday city carrier hours are clocked to SPR, which in this proposal would all be distributed to the SPR street distribution key⁶. The number of in-office hours for letter routes on Sundays is too small to justify on-site sampling on Sundays. This proposal treats the costs for in-office hours for letter routes on Sunday as In-Office Support, similar to afternoon in-office hours.

Estimation of Costs for Carriers

The Postal Service proposes to use TACS data at a level of detail even finer than proposed in Proposal Nine in Docket No. RM2015-2. TACS hours are compiled not just by craft group, route group and MODS category, as per Proposal Nine, but also by finance number, day of week and time bin. DOIS data are compiled for each finance number and zone. These provide control totals for costs by craft group, day of week and time bin. These detailed clocked hours also supply weights for the individual

⁵ During FY2016 Q2 and Q3, there were only 479 readings conducted on SPR carriers in-office in the mornings, and only 219 were direct tallies handling a mailpiece. In comparison, for letter carriers there were 59,972 in-office readings and 37,493 direct tallies.

⁶ On Sundays, there is an apparent relatively greater percentage of in-office hours compared to weekdays. However, on Monday through Saturday carriers load their vehicles while clocked to street, while on while Sundays they clock to the office while loading their vehicles. Thus, the apparent differences in the SPR office/street ratio are due to the different clocking procedures, not to actual differences in activities.

IOCS-Cluster readings so that they represent their zone appropriately, using the in-office hours for that zone. The time bins are quite short, only fifteen minutes duration during the morning. This controls for variation in the rate of conducting readings during different tests and even for different time bins within the same test. Appendix A describes the estimation methodology in more detail.

To be consistent with the IOCS-Cluster design, the Postal Service also proposes to change the methodology for distributing mixed mail back to products.⁷ The methodology from Proposal Nine distributes mixed mail within CAG, route group, and basic function. Since the IOCS-Cluster design does not use CAG, the proposed methodology distributes mixed mail within route group and basic function only.⁸

For carriers acting as supervisors or clerks, TACS data on employees whose base roster designation is a carrier but who have clocked to a different craft will be used.

Sample sizes

Table 1 displays the proposed numbers of tests by each sampling mode, and the projected number of active readings that we expect to obtain from each mode.

⁷ The CARrier Mixed Mail (CARMM) program executes this estimation step.

⁸ If the Commission accepts the proposal to treat all SPR in-office time as support time, then there will only be one route group: letter routes.

Table 1: Proposed Sample Sizes and Projected Number of Active Readings

Sampling Mode	Proposed number of tests per year	Projected number of active readings per test*	Projected number of active readings per year
AM On-site, stand-alone	4,000	30	120,000
AM On-site, synchronized with CCCS	1,000	8	8,000
PM Telephone	0	0.3	0
Total	5,000		128,000

*From FY2016 Q2 and Q3 data.

By comparison, the current non-cluster IOCS obtains fewer than 35,000 active in-office readings annually, so the Postal Service projects that IOCS-Cluster will obtain more than three times as much data. Furthermore, over 80 percent of carrier readings are telephone readings in current IOCS. The proposed cluster design results in 100 percent on-site readings during the morning hours when carriers are in-office and handling mail.

Variances

Variances and CVs will be estimated using a replication technique such as the bootstrap method that is currently used for IOCS; however, those estimates are not available at this time. While cluster sampling designs can inflate the variances of estimates due to intra-cluster correlation⁹, it is unlikely that correlations would be so large as to overcome the improvement due to the large increase in the number of active readings. In FY2016 Q2 and Q3, IOCS-Cluster obtained 59,972 active in-office readings

⁹ Lohr, S., *Sampling: Design and Analysis*, Pacific Grove: Duxbury, 1999, pp. 138-140

during on-site morning tests compared to only 16,588 from non-cluster IOCS; see Table 2 below.

Carriers Clocking to Other Crafts

Occasionally carriers are temporarily assigned to act as supervisors, essentially loaned to the supervisor craft. These employees are also included in the IOCS-Cluster random sequence of carriers and data collectors conduct supervisor-style readings on them. Unsurprisingly, these carriers become supervisors in charge of city delivery carriers, as well as of clerks or rural carriers. During IOCS-Cluster tests, data collectors sample all carriers in the facility who have clocked in as supervisors.

Because it is possible to separately identify the hours for employees who clock to a roster designation that is different from their base, control totals for these readings are also derived from TACS data. The percentage of these TACS hours out of all supervisor hours is used to calculate the control total for this carrier-based portion of supervisor costs. For consistency, TACS data are also used to weight non-cluster IOCS data for supervisors who were not originally carriers, such that total dollars from both non-cluster and IOCS-Cluster supervisor readings equals the trial balance accrued dollars for supervisors as a whole.

In principle, the same approach can be used for carriers who clock in as clerks or mailhandlers. However, due partly to the very small number of such readings and partly to technical problems, this feature has not yet been implemented. The impact on costs would be very small.

Rationale

The primary objective of this proposal is to replace telephone readings with on-site readings. Technological improvements in the collection of detailed time-clock data provide the opportunity to change the data collection methodology. Rather than distributing readings widely in time and space, it is now possible to cluster readings at the times and locations when carriers are in the office. The proposed IOCS-Cluster system collects data efficiently when there are a large number of carriers in the office, justifying sending a data collector on-site.

While it is difficult to justify stand-alone cluster tests when there are few carriers in the office, for example zones with few city carriers, the IOCS-Cluster tests synchronized with CCCS tests address this concern and obtain on-site readings even for these small-zone offices.

Carriers in the office in the afternoon are another situation where it is difficult and inefficient to obtain data, so this proposal recommends treating afternoon in-office hours as a support cost. Similarly, SPR carriers spend little time in the office and less handling mail, so we similarly recommend treating in-office time as support time for SPR on the street.

Another justification for this proposal is the resulting improvement in sampling efficiency. Table 2 summarizes the performance for each sampling mode based on the FY2016 Q2 and Q3 results in terms of the number of readings per test type and the number of active readings where the carrier was in the office. Sampling efficiency is the percentage of readings where the carrier is in the office compared to the number of

attempted readings. Both of the on-site sampling modes of IOCS-Cluster are much more efficient than the current non-cluster system.

Table 2: Performance by Test Type

Test Type	Number of tests conducted	Number of attempted readings	Number of active in-office readings	Attempts per test	Active readings per test	Sampling efficiency
Morning, large-zone	1,830	140,377	56,168	77	31	40%
Morning, small-zone	455	6,934	3,804	15	8	55%
Afternoon	556	15,730	389	28	0.70	2%
Current non-cluster IOCS	113,054	113,054	16,588	1	0.15	15%

Data from FY2016 Q2 and Q3.

Impact

IOCS-Cluster results in a significant increase in the percentage of direct tallies where the carrier is handling a mailpiece, and corresponding decreases in tallies for support and administrative activities (no mailpiece) and mixed mail; see Table 3.

Table 3: IOCS-Cluster Impact on Tally Categories

Tally category	Non-Cluster (%)	IOCS-Cluster (%)	% change
Direct (mailpiece)	48%	72%	49%
Mixed mail	18%	11%	-37%
Support/Admin	34%	17%	-50%
Total	100%	100%	

Table 4 below compares the costs for cost segments 6 and 7 and for total CRA costs, for FY2016 Q2 and Q3. The revised costs are based on data from the national implementation of IOCS-Cluster that is running in parallel with non-cluster IOCS. A

Proposal Three

comparable table disaggregating the costs for competitive products is provided under seal as part of nonpublic folder USPS-RM2016-11/NP11.

The pilot data indicate some significant shifts in product costs. For example, city carrier in-office costs for First-Class letters decrease, while measured in-office costs are projected to increase for a number of products, including parcel-shaped products, Bound Printed Matter, Periodicals, Standard Mail, and International Mail.

Table 4: IOCS-Cluster Impact on Product Costs

CRA Product Group	CS6&7 FY16Q2Q3 CRA (\$000)	CS6&7 FY16Q2Q3 Cluster (\$000)	% change Cluster vs. CRA	FY2015 Total Attributable (\$000)	Revised FY2015 Total Attributable (\$000)	% change in Total Attributable
DOMESTIC MARKET DOMINANT PRODUCTS						
First-Class Mail						
Total Single Piece Letters and Cards	626,294	548,645	-12.4%	5,514,455	5,299,413	-3.9%
Total Presort Letters and Cards	566,684	528,132	-6.8%	4,876,363	4,772,947	-2.1%
Flats	106,253	107,540	1.2%	1,559,381	1,562,764	0.2%
Parcels	24,834	32,004	28.9%	486,326	504,601	3.8%
Total First-Class	1,324,066	1,216,321	-8.1%	12,436,525	12,139,724	-2.4%
Standard Mail						
All ECR	608,751	668,158	9.8%	3,427,827	3,597,033	4.9%
Letters	640,111	673,326	5.2%	4,930,233	5,020,558	1.8%
Flats	293,164	294,843	0.6%	2,633,377	2,637,862	0.2%
Parcels	4,586	5,369	17.1%	89,402	92,278	3.2%
Total Standard Mail	1,546,612	1,641,696	6.1%	11,080,839	11,347,732	2.4%
Total Periodicals	209,117	266,418	27.4%	2,101,077	2,261,201	7.6%
Package Services						
Bound Printed Matter Flats	9,193	16,219	76.4%	151,082	177,095	17.2%
Bound Printed Matter Parcels	22,280	28,937	29.9%	238,770	256,635	7.5%
Media and Library Mail	8,007	8,707	8.7%	359,083	360,861	0.5%
Total Package Services	39,481	53,863	36.4%	768,082	813,738	5.9%
U.S. Postal Service	18,165	21,170	16.5%			
Free Mail	2,307	2,442	5.8%	41,294	41,803	1.2%
Total Domestic Market Dominant Mail	3,139,748	3,201,909	2.0%	26,427,816	26,604,199	0.7%
Total Domestic Market Dominant Services	65,486	69,211	5.7%	1,169,827	1,180,570	0.9%
Total Domestic Market Dominant Attributable Costs	3,205,234	3,271,120	2.1%	27,597,643	27,784,769	0.7%
Total Domestic Competitive Attributable Costs	400,894	472,365	17.8%	10,701,138	10,895,673	1.8%
INTERNATIONAL MAIL AND SERVICES	38,397	46,667	21.5%	1,960,928	1,981,546	1.1%
TOTAL ATTRIBUTABLE COSTS	3,644,525	3,790,153	4.0%	40,259,709	40,661,988	1.0%
OTHER COSTS	4,210,641	4,065,014	-3.5%	33,751,178	33,348,899	-1.2%
TOTAL COSTS	7,855,166	7,855,166	0.0%	74,010,886	74,010,886	0.0%

Appendix A: In-Office Cost System: Cluster (IOCS-Cluster) Statistical Documentation

Overview

The In-Office Cost System (IOCS)-Cluster subsystem is a continuous, ongoing statistical sampling system to estimate the costs of various activities performed by city carriers while working in-office. Although the Postal Accounting system tracks costs for various categories of employees, it does not identify labor costs by product because carriers are simultaneously processing more than one product in most operations. IOCS-Cluster is designed to supplement the accounting system data by sampling carriers at randomly selected points in time throughout the year. When a data collector samples a carrier that is working in-office, they record the activity of that carrier into a laptop computer using the IOCS Computerized On-Site Data Entry System (CODES-IOCS) software.

These sample data, in combination with data from the accounting system, the Delivery and Operations System (DOIS), and the Time and Attendance Collection System (TACS), are used to provide detailed estimates of attributable costs for various activities.

Statistical Study Design

The universe under study in IOCS consists of all the in-office work time during a fiscal year, of all City Carriers. The IOCS-Cluster subsystem is a two-stage cluster sampling system. The first stage is the zone/facility-day. This defines the cluster of

carriers to sample during the morning hours. The second stage is the moment in time for the carriers working in-office.

First Stage Sample (Zone)

The first-stage sampling unit is a zone/facility-day. The frame is the set of delivery zones and facilities with at least one city carrier route.¹⁰ There are two sampling modes: large zones have six or more city carrier routes, while small zones have five or fewer routes. At large zones, there are a sufficiently large number of carriers that it is cost-effective for a data collector to conduct a stand-alone IOCS-Cluster test. However, at small zones there are too few carriers to justify a stand-alone test. For those zones, IOCS-Cluster is synchronized with the City Carrier Cost System (CCCS), since a data collector is scheduled to be on-site for the CCCS test anyway.

Zone selection for large zones

For the large zone mode, the frame consists of all delivery zones that have at least six city carrier routes at a facility. The number of in-office workhours recorded in DOIS in the preceding weeks is used to order the zones and a systematic random sample is selected.

Zone selection for small zones

For the small zone mode, the first-stage zone/facility-day is determined from the CCCS. When CCCS selects a route that is part of a zone with five or fewer routes,

¹⁰ Finance number is used to represent the facility

IOCS-Cluster conducts a test for that zone. Since CCCS selects routes randomly, this is equivalent to selecting zones in proportion to size, by the number of routes.

Possible delivery dates (every Monday through Saturday, excluding holidays) are randomized and systematically assigned to selected zones to determine the zone/facility-days. These are the first-stage sampling units and define the cluster of carriers that are eligible for sampling in the second stage.

Second Stage Sample (Time)

The second-stage sampling unit is the moment in time of carriers working in-office. Before the test begins, data collectors identify the carriers scheduled to work in the selected zone on the test day and who are eligible for sampling. A hashing algorithm reorders this list into a pseudo-random sequence. Once these carriers begin to clock in for the day, the data collector samples them in the randomized sequence. If they complete readings on all carriers in the list, they start at the beginning of the list again. However, a second reading may not be conducted on the same individual within a twenty-minute interval. If a carrier unexpectedly begins working in the tested zone after the test has begun, the data collector inserts the new carrier into the list for sampling.

Time selection for large zones

At zones with a large number of routes, IOCS-Cluster tests are stand-alone test. Data collectors sample carriers continuously throughout the morning. As they complete each reading, they proceed to sample the next carrier in the list.

Time selection for small zones

At zones with few routes that have too few carriers to justify conducting a stand-alone test, IOCS-Cluster tests are synchronized with CCCS tests. Out of each half-hour, the data collector uses twenty minutes to conduct CCCS tasks and ten minutes to conduct IOCS-Cluster readings. The ten-minute block of time for IOCS-Cluster is pre-selected randomly. Within the ten-minute period, data collectors conduct one reading after another, and they continue to conduct readings in ten-minute time blocks as long as carriers are working in-office.¹¹

Estimation

The weights for each IOCS-Cluster record are developed using census data from TACS and DOIS for the tested office and the time bin in which the reading occurred, in addition to the national level accrued quarterly payroll data for carriers.

Cost controls and weighting factors are calculated separately for two subgroups of carriers: a) full-time regular, roster designation 13 and b) part-time / transitional carriers, including city carrier assistants (CCAs), all other carrier roster designations. Payroll systems provide the total labor cost for each subgroup. TACS data allocates each of these subgroup's costs to carrier assignment categories (in-office, street or training) and to route groups (letter or special purpose).

¹¹ In order to control workload, data collection ends at 11:00.

IOCS-Cluster develops cost estimates for the activities of carriers working in-office and assigned to letter routes. Cost weights for each non-stop reading are calculated as:

$$CW_{ijkl} = \left(\frac{1}{n_{ijkl}} \right) * \left(\frac{H_{ijkl}}{\sum_{l=1}^m H_{ijkl}} \right) * \left(\frac{H_{ijk}}{H_i} \right) * SMA(S(l)) * C_i^{reg,off}$$

where

i	craft subgroup (fulltime/regular or part-time/transitional/CCA);
j	day of week;
k	time bin;
l	zone;
S, S(l)	sampling mode that depends on zone size (large or small)
m	number of zones sampled;
n	number of non-stop tallies;
CW	cost weight assigned to each non-stop reading;
H	hours clocked in-office, letter-routes for the quarter;
H ^S	hours clocked to zones in sampling mode S
SMA(S)	Sampling Mode Adjustment that depends on the zone size
C ^{reg,off}	carrier labor costs assigned to regular letter routes and in-office based on the proportion of TACS hours.

The accrued costs allocated to carriers clocked to office and to regular letter routes, C^{reg,off}, are obtained from TACS and payroll data,

$$C_i^{reg,off} = \left(\frac{H_i^{TACS}}{HTOT_i^{TACS}} \right) * C_i$$

where

H _i ^{TACS}	TACS hours clocked to office and to regular letter routes for carrier subgroup i;
HTOT _i ^{TACS}	total TACS hours for carrier subgroup i;
C _i	accrued labor cost for carrier subgroup i.

For offices with only one delivery zone, the TACS hours for the finance number are used. For offices with multiple zones, DOIS is used to obtain hours clocked to each zone, as it maps TACS hours from each finance number to the correct zone. In these cases,

$$H_{ijkl} = \left(\frac{HTOT_{lf}^{DOIS}}{HTOT_f^{DOIS}} \right) * H_{ijkf}^{TACS}$$

where

$HTOT_{lf}^{DOIS}$ total DOIS carrier hours for zone l in finance number f;

$HTOT_f^{DOIS}$ total DOIS carrier hours for finance number f;

H_{ijkf}^{TACS} total TACS carrier hours for finance number f, craft subgroup i, day of week j and time bin k.

Sampling of small zones with fewer than five routes is limited because the data collector devotes only a portion of time to IOCS-Cluster, while the CCS test taken simultaneously is their higher priority. Because these small zone tests sample carriers at a different rate than large zone tests, there are a larger percentage of time bins with no sampling data from individual tests. Therefore, the weighting factors for each sampling mode are adjusted to account for this effect using the relative ratios of TACS hours for all zones divided by the TACS hours for sampled zones, by sampling mode.

$$SMA(S) = \left(\frac{H^S}{\sum_{l \in S} H_l} / \frac{H}{\sum_{l=1}^m H_l} \right) = \left(\frac{H^S}{H} * \frac{\sum_{l=1}^m H_l}{\sum_{l \in S} H_l} \right)$$

Proposal Three

The weighting factors for readings are controlled in proportion to the TACS in-office hours clocked by the tested zone for each day of week and time bin (referred to hereafter as just time bin for brevity). Each non-stop reading within a time bin gets an equal share of the weight for that time bin. Time bins are 15 minutes duration during the morning hours between 07:00 and 11:00. Times before 07:00 are one bin, while times after 11:00 are one bin.

Mixed Mail

Similar to non-cluster IOCS, costs for tallies where the carrier is handling mixed mail are redistributed to products. However, because the sampling frame does not depend on the CAG of the finance number, CAG is not included as a factor in the cost redistribution. In this proposal, the recommended alternative is that SPR carriers are not sampled; therefore, there is only one route group, the letter route group and redistribution is done only by basic function.

Carriers Clocking to Other Crafts

For carriers who temporarily clock to a different craft, such as a supervisor, detailed TACS data summarizing hours by employees' base craft group as well as by their clocked craft group develop the cost control totals. The control total cost is distributed to all readings of the clocked craft equally. TACS data are also used to weight non-cluster IOCS data, such that for each craft group the total dollar-weights from both non-cluster and IOCS-Cluster equal the total costs from the trial balance.